

**1997 Comprehensive Ground Water Monitoring Evaluation (CME)**  
**Boyertown Sanitary Landfill**  
**Douglass Township, Montgomery County**

**Pa. D.E.P., Southeast Regional Office**  
**Waste Management Program**  
**Suite 6010 Lee Park**  
**555 North Lane Conshohocken, PA 19428**

**COPY**

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#### Facility Location:

Boyertown Sanitary Landfill is located on Merkel Road, in Douglass Township, Montgomery County. A facility location map is provided as **Figure 1**. This map is excerpted from the U.S. Geological Survey 7.5 Minute Topographic Series, Sassamansville Quadrangle.

#### Narrative:

An Order of the Department was issued in March of this year and is provided in **Appendix C**. This order addressed matters of continued non-compliance at this closed municipal and hazardous waste disposal facility. Some measures have been taken (**June 23, 1997 letter, Appendix C**) by the owner/operator of this facility to comply with this order including the collection of ground-water samples, however, the Department was not notified prior to this event so as to be present to collect confirmatory samples. The Department is continuing to actively pursue alternatives to return this facility to a compliance status.

Additionally, Boyertown Sanitary Landfill has petitioned the Berks-Montgomery Municipal Authority Board to cease pretreatment of leachate generated at this facility, and transmitted to the authority for treatment, based on an analysis of past analytical data (**September 15, 1997 letters, Appendix C**).

#### CME Worksheet:

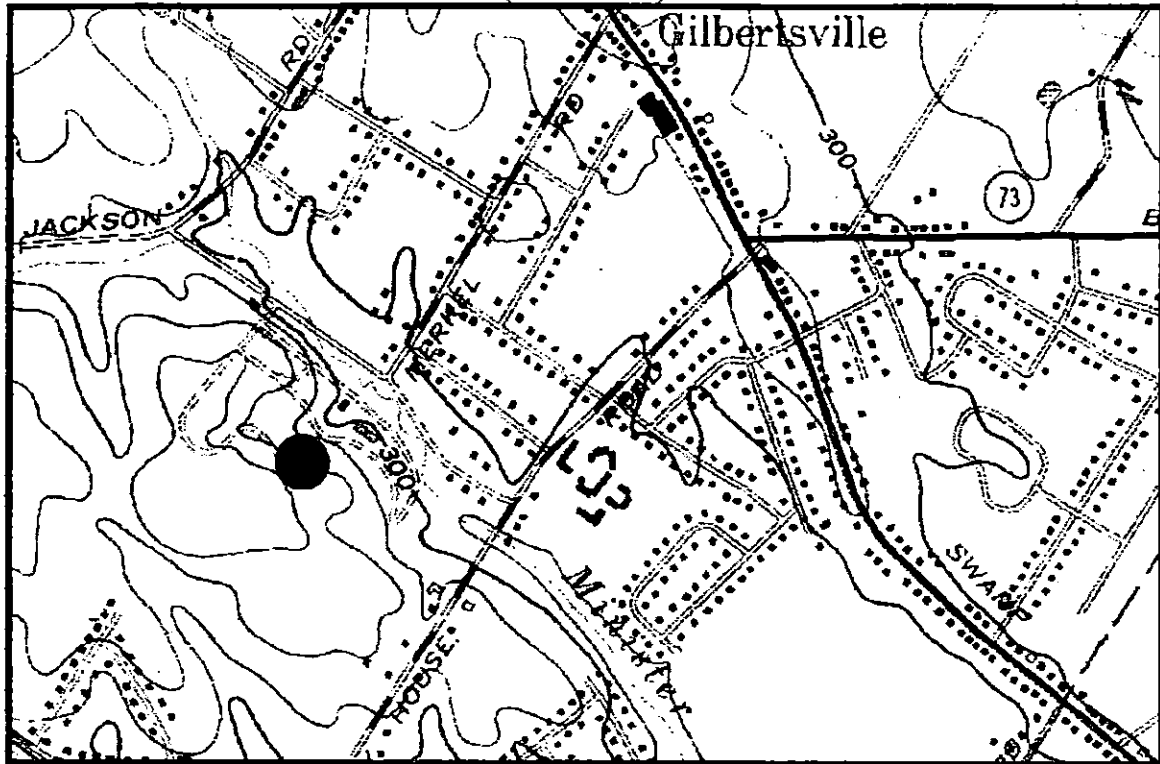
A completed Comprehensive Ground Water Monitoring Evaluation Worksheet is provided as **Appendix A**.

#### Analytical Results:

Analytical results for ground-water samples collected in 1997 are provided as **Appendix B**. This includes results for analyses of samples collected and analyzed by the facility operator. Confirmatory sampling was not conducted at this facility as a result of the operator's failure to notify the Department prior to sampling activities.

Figure I (Facility Location Map)

Boyertown Sanitary Landfill  
Douglass Township, Montgomery County  
(not to scale)



Excerpted From:  
U.S. Geological Survey 7.5 Minute Topographic Series, Sassamansville Quadrangle  
(large shaded circle marks approximate location of facility)

Appendix A (Comprehensive Ground Water Monitoring Evaluation Worksheet)

# COMPREHENSIVE GROUND-WATER MONITORING EVALUATION WORKSHEET

The following worksheets have been designed to assist the enforcement officer/technical reviewer in evaluating the ground-water monitoring system an owner/operator uses to collect and analyze samples of ground water. The focus of the worksheets is technical adequacy as it relates to obtaining and analyzing representative samples of ground water. The basis of the worksheets is the final RCRA Ground Water Monitoring Technical Enforcement Guidance Document which describes in detail the aspects of ground-water monitoring which EPA deems essential to meet the goals of RCRA. Appendix A is not a regulatory checklist. Specific technical deficiencies in the monitoring system can, however, be related to the regulations as illustrated in Figure 4.3 taken from the RCRA Ground-Water Monitoring Compliance Order Guide (COG) (included at the end of the appendix). The enforcement officer, in developing an enforcement order, should relate the technical assessment from the worksheets to the regulations using Figure 4.3 from the COG as a guide.

Comprehensive Ground-Water Monitoring Evaluation	Y/N
<b>L Office Evaluation Technical Evaluation of the Design of the Ground-Water Monitoring System</b>	
<b>A. Review of Relevant Documents</b>	
1. What documents were obtained prior to conducting the inspection:	
a. RCRA Part A permit application?	Y
b. RCRA Part B permit application?	Y
c. Correspondence between the owner/operator and appropriate agencies or citizens's groups?	Y
d. Previously conducted facility inspection reports?	Y
e. Facility's contract reports?	N
f. Regional hydrogeologic, geologic, or soil reports?	Y
g. The facility's Sampling and Analysis Plan?	N
h. Ground-water Assessment Program Outline (or Plan, if the facility is in assessment monitoring)?	N
i. Other (specify) _____	-

<b>B. Evaluation of the Owner/Operator's Hydrogeologic Assessment</b>		
1. Did the owner/operator use the following direct techniques in the hydrogeologic assessment:		-
a. Logs of the soil borings/rock corings (documented by a professional geologist, soil scientist, or geotechnical engineer)?		?
b. Materials tests (e.g., grain size analyses, standard penetration tests, etc.)?		?
c. Piezometer installation for water level measurements at different depths?		?
d. Slug tests?		?
e. Pump tests?		?
f. Geochemical analyses of soil samples?		?
g. Other (specify) (e.g., hydrochemical diagrams and wash analysis)		?
2. Did the owner/operator use the following indirect technique to supplement direct techniques data:		-
a. Geophysical well logs?		?
b. Tracer studies?		?
c. Resistivity and/or electromagnetic conductance?		?
d. Seismic Survey?		?
e. Hydraulic conductivity measurements of cores?		?
f. Aerial photography?		?
g. Ground penetrating radar?		?
h. Other (specify)		?
3. Did the owner/operator document and present the raw data from the site hydrogeologic assessment?		Y
4. Did the owner/operator document methods (criteria) used to correlate and analyze the information?		Y
5. The owner/operator prepare the following:		-
a. Narrative description of geology?		Y
b. Geologic cross sections?		N
c. Geologic and soil maps?		N
d. Boring/coring logs?		Y
e. Structure contour maps of the differing water bearing zones and confining layer?		N
f. Narrative description and calculation of ground-water flows?		Y

	Y/N
g. Water table/potentiometric map?	Y
h. Hydrologic cross sections?	N
6. Did the owner/operator obtain a regional map of the area and delineate the facility?	Y
If yes, does this map illustrate:	
a. Surficial geology features?	N
b. Streams, rivers, lakes, or wetlands near the facility?	Y
c. Discharging or recharging wells near the facility?	N
7. Did the owner/operator obtain a regional hydrogeologic map?	Y
If yes, does this hydrogeologic map indicate:	
a. Major areas of recharge/discharge?	Y
b. Regional ground-water flow direction?	Y
c. Potentiometric contours which are consistent with observed water level elevations?	Y
8. Did the owner/operator prepare a facility site map?	Y
If yes, does the site map show:	
a. Regulated units of the facility (e.g., landfill areas, impoundments)?	Y
b. Any seeps, springs, streams, ponds, or wetlands?	Y
c. Location of monitoring wells, soil borings, or test pits?	Y
d. How many regulated units does the facility have? _____	1
If more than one regulated unit then,	
• Does the waste management area encompass all regulated units?	-
• Is a waste management area delineated for each regulated unit?	-
<b>C. Characterization of Subsurface Geology of Site</b>	
1. Soil boring/test pit program:	-
a. Were the soil borings/test pits performed under the supervision of a qualified professional?	Y
b. Did the owner/operator provide documentation for selecting the spacing for borings?	Y
c. Were the borings drilled to the depth of the first confining unit below the uppermost zone of saturation or ten feet into bedrock?	?
d. Indicate the method(s) of drilling:	-



		Y/N
Auger (hollow or solid stem)	_____	
Mud rotary	_____	
Reverse rotary	_____	
Cable tool	_____	
Jetting	_____	?
Other (specify) _____		
e. Were continuous sample corings taken?		?
f. How were the samples obtained (checked method(s))		
• Split spoon	_____	
• Shelby tube, or similar	_____	
• Rock coring	_____	
• Ditch sampling	_____	
• Other (explain) _____		?
g. Were the continuous sample corings logged by a qualified professional in geology?		?
h. Does the field boring log include the following information:		
• Hole name/number?		?
• Date started and finished?		
• Driller's name?		?
• Hole location (i.e., map and elevation)?		?
• Drill rig type and bit/auger size?		?
• Gross petrography (e.g., rock type) of each geologic unit?		?
• Gross mineralogy of each geologic unit?		?
• Gross structural interpretation of each geologic unit and structural features (e.g., fractures, gouge material, solution channels, buried streams or valleys, identification of depositional material)?		?
• Development of soil zones and vertical extent and description of soil type?		?
• Depth of water bearing unit(s) and vertical extent of each?		?
• Depth and reason for termination of borehole?		?
• Depth and location of any contaminants encountered in borehole?		?
• Sample location/number?		?
• Percent sample recovery?		?
• Narrative descriptions of:		?
—Geologic observations?		?
—Drilling observations?		?
i. Were the following analytical tests performed on the core samples:		
• Mineralogy (e.g., microscopic tests and x-ray diffraction)?		?
• Petrographic analysis:		
—degree of crystallinity and cementation of matrix?		?
—degree of sorting, size fraction (i.e., sieving), textural variations?		?
—rock type(s)?		?

—soil type?	?
—approximate bulk geochemistry?	?
—existence of microstructures that may affect or indicate fluid flow?	?
• Falling head tests?	?
• Static head tests?	?
• Settling measurements?	?
• Centrifuge tests?	?
• Column drawings?	?
<b>D. Verification of Subsurface Geological Data</b>	
1. Has the owner/operator used indirect geophysical methods to supplement geological conditions between borehole locations?	N
2. Do the number of borings and analytical data indicate that the confining layer displays a low enough permeability to impede the migration of contaminants to any stratigraphically low water-bearing units?	N
3. Is the confining layer laterally continuous across the entire site?	N/A
4. Did the owner/operator consider the chemical compatibility of the site-specific waste types and the geologic materials of the confining layer?	Y
5. Did the geologic assessment address or provide means for resolution of any information gaps of geologic data?	N
6. Do the laboratory data corroborate the field data for petrography?	?
7. Do the laboratory data corroborate the field data for mineralogy and subsurface geochemistry?	?
<b>E. Presentation of Geologic Data</b>	
1. Did the owner/operator present geologic cross sections of the site?	Y
2. Do cross sections:	
a. identify the types and characteristics of the geologic materials present?	Y
b. define the contact zones between different geologic materials?	Y
c. note the zones of high permeability or fracture?	Y
d. give detailed borehole information including:	N

• location of borehole?	I / N
• depth of termination?	N
• location of screen (if applicable)?	N
• depth of zone(s) of saturation?	N
• backfill procedure?	Y
	N
3. Did the owner/operator provide a topographic map which was constructed by a licensed surveyor?	Y
4. Does the topographic map provide:	
a. contours at a maximum interval of two-feet?	Y
b. locations and illustrations of man-made features (e.g., parking lots, factory buildings, drainage ditches, storm drain, pipelines, etc.)?	Y
c. descriptions of nearby water bodies?	Y
d. descriptions of off-site wells?	N
e. site boundaries?	Y
f. individual RCRA units?	Y
g. delineation of the waste management area(s)?	Y
h. well and boring locations?	Y
5. Did the owner/operator provide an aerial photograph depicting the site and adjacent off-site features?	N
6. Does the photograph clearly show surface water bodies, adjacent municipalities, and residences and are these clearly labelled?	N
<b>F. Identification of Ground-Water Flowpaths</b>	
1. Ground-water flow direction	
a. Was the well casing height measured by a licensed surveyor to the nearest 0.01 feet?	Y
b. Were the well water level measurements taken within a 24 hour period?	Y
c. Were the well water level measurements taken to the nearest 0.01 feet?	Y
d. Were the well water levels allowed to stabilize after construction and development for a minimum of 24 hours prior to measurements?	Y
e. Was the water level information obtained from (check appropriate one):	
• multiple piezometers placed in single borehole? _____	
• vertically nested piezometers in closely spaced separate _____	
• boreholes? _____	
• monitoring wells? _____	
	X

	Y/N
f. Did the owner/operator provide construction details for the piezometers?	
g. How were the static water levels measured (check method(s)).	
• Electric water sounder _____	
• Wetted tape _____	
• Air line _____	
• Other (explain) _____	
h. Was the well water level measured in wells with equivalent screened intervals at an equivalent depth below the saturated zone?	N
i. Has the owner/operator provided a site water table (potentiometric) contour map?	Y
If yes,	
• Do the potentiometric contours appear logical and accurate based on topography and presented data? (Consult water level data)	Y
• Are ground-water flow-lines indicated?	Y
• Are static water levels shown?	Y
• Can hydraulic gradients be estimated?	Y
j. Did the owner/operator develop hydrologic cross sections of the vertical flow component across the site using measurements from all wells?	N
k. Do the owner/operator's flow nets include:	
• piezometer locations?	N
• depth of screening?	N
• width of screening?	N
• measurements of water levels from all wells and piezometers?	N
<b>2. Seasonal and temporal fluctuations in ground-water</b>	
a. Do fluctuations in static water levels occur? If yes, are the fluctuations caused by any of the following:	Y
—Off-site well pumping	N
—Tidal processes or other insurmountable natural variations (e.g., river stage, etc.)	N
—On-site well pumping	N
—Off-site, on-site construction or changing land use patterns	N
—Deep well injection	N
—Seasonal variations	Y
—Other (specify) _____	
b. Has the owner/operator documented sources and patterns that contribute to or affect the ground-water patterns below the waste management?	Y
c. Do water level fluctuations alter the general ground-water gradients and flow directions?	Y
d. Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone?	Y

		Y/N
e. Did the owner/operator implement means for gauging long term effects on water movement that may result from on-site or off-site construction or changes in land-use patterns?		N
3. Hydraulic conductivity		
a. How were hydraulic conductivities of the subsurface materials determined?		?
• Single-well tests (slug tests)?		?
• Multiple-well tests (pump tests)		?
• Other (specify) _____		?
b. If single-well tests were conducted, was it done by:		?
• Adding or removing a known volume of water?		?
• Pressurizing well casing?		?
c. If single well tests were conducted in a highly permeable formation, were pressure transducers and high-speed recording equipment used to record the rapidly changing water levels?		?
d. Since single well tests only measure hydraulic conductivity in a limited area, were enough tests run to ensure a representative measure of conductivity in each hydrogeologic unit?		?
e. Is the owner/operator's slug test data (if applicable) consistent with existing geologic information (e.g., boring logs)?		?
f. Were other hydraulic conductivity properties determined?		?
g. If yes, provide any of the following data, if available:		?
• Transmissivity _____		
• Storage coefficient _____		
• Leakage _____		
• Permeability _____		
• Porosity _____		
• Specific capacity _____		
• Other (specify) _____		
4. Identification of the uppermost aquifer		
a. Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined? If yes,		Y
• Are soil boring/test pit logs included?		N
• Are geologic cross-sections included?		N
b. Is there evidence of confining (competent, unfractured, continuous, and low permeability) layers beneath the site? If yes,		Y
• how was continuity demonstrated? <u>REGIONAL PETROGRAPHY</u>		
c. What is hydraulic conductivity of the confining unit (if present)? CM/Sec How was it determined?		?

	Y/N
<p>d. Does potential for other hydraulic communication exist (e.g., lateral incontinuity between geologic units, facies changes, fracture zones, cross cutting structures, or chemical corrosion/alteration of geologic units by leachage? If yes or no, what is the rationale?</p> <p style="text-align: center;">REGIONAL FRACTURES, BRUNSWICK FM.</p> <p>_____</p> <p>_____</p> <p>_____</p>	
<p><b>G. Office Evaluation of the Facility's Ground-Water Monitoring System—Monitoring Well Design and Construction:</b></p> <p>These questions should be answered for each different well design present at the facility.</p> <p><b>1. Drilling Methods</b></p> <p>a. What drilling method was used for the well?</p> <ul style="list-style-type: none"> <li>• Hollow-stem auger <input type="checkbox"/></li> <li>• Solid-stem auger <input type="checkbox"/></li> <li>• Mud rotary <input type="checkbox"/></li> <li>• Air rotary <input type="checkbox"/></li> <li>• Reverse rotary <input type="checkbox"/></li> <li>• Cable tool <input type="checkbox"/></li> <li>• Jetting <input type="checkbox"/></li> <li>• Air drill w/ casing hammer <input type="checkbox"/></li> <li>• Other (specify) _____</li> </ul> <p>b. Were any cutting fluids (including water) or additives used during drilling? If yes, specify:</p> <ul style="list-style-type: none"> <li>• Type of drilling fluid _____</li> <li>• Source of water used _____</li> <li>• Foam _____</li> <li>• Polymers _____</li> <li>• Other _____</li> </ul> <p>c. Was the cutting fluid, or additive, identified? _____</p> <p>d. Was the drilling equipment steam-cleaned prior to drilling the well?</p> <ul style="list-style-type: none"> <li>• Other methods _____</li> </ul> <p>e. Was compressed air used during drilling? If yes,</p> <ul style="list-style-type: none"> <li>• was the air filtered to remove oil? _____</li> </ul> <p>f. Did the owner/operator document procedure for establishing the potentiometric surface? If yes,</p> <ul style="list-style-type: none"> <li>• how was the location established? _____</li> </ul> <p>g. Formation samples</p>	<p>?</p> <p>?</p> <p>N</p> <p>?</p> <p>?</p> <p>?</p> <p>?</p>

	Y/N	
• Were formation samples collected initially during drilling?	?	
• Were any cores taken continuous?	?	
• If not, at what interval were samples taken?	?	
• How were the samples obtained? — Split spoon — Shelby tube — Core drill — Other (specify)	?	
• Identify if any physical and/or chemical tests were performed on the formation samples (specify) _____ _____ _____	?	
<b>2. Monitoring Well Construction Materials</b>		
<b>a. Identify construction materials (by number) and diameters (ID/OD)</b>		
	<b>Material</b>	<b>Diameter</b>
• Primary Casing	PVC	4"
• Secondary or outside casing (double construction)	_____	_____
• Screen	_____	_____
<b>b. How are the sections of casing and screen connected?</b>		
• Pipe sections threaded		?
• Couplings (friction) with adhesive or solvent		?
• Couplings (friction) with retainer screws		?
• Other (specify)		?
<b>c. Were the materials steam-cleaned prior to installation?</b>		
• If no, how were the materials cleaned? _____		?
<b>3. Well Intake Design and Well Development</b>		
<b>a. Was a well intake screen installed?</b>		
• What is the length of the screen for the well? _____		?
• Is the screen manufactured?		?
<b>b. Was a filter pack installed?</b>		
• What kind of filter pack was employed? _____		?
• Is the filter pack compatible with formation materials?		?
• How was the filter pack installed? _____		?

	I / N
• What are the dimensions of the filter pack?	?
• Has a turbidity measurement of the well water ever been made?	Y
• Have the filter pack and screen been designed for the insitu materials?	?
c. Well development	Y
• Was the well developed?	
• What technique was used for well development?	
—Surge block	
—Bailer	
—Air surging	
<del>XXX</del> —Water pumping	
—Other (specify) _____	
<b>4. Annular Space Seals</b>	
a. What is the annular space in the saturated zone directly above the filter pack filled with:	?
—Sodium bentonite (specify type and grit)	
—Cement (specify neat or concrete)	
—Other (specify)	
b. Was the seal installed by:	?
—Dropping material down the hole and tamping	
—Dropping material down the inside of hollow-stem auger	
—Tremie pipe method	
—Other (specify)	
c. Was a different seal used in the unsaturated zone? If yes,	?
• Was this seal made with?	?
—Sodium bentonite (specify type and grit)	
—Cement (specify neat or concrete)- Other (specify)	
• Was this seal installed by?	?
—Dropping material down the hole and tamping	
—Dropping material down the inside of hollow stem auger	
—Other (specify)	
d. Is the upper portion of the borehole sealed with a concrete cap to prevent infiltration from the surface?	Y
e. Is the well fitted with an above-ground protective device and bumper guards?	Y
f. Has the protective cover been installed with locks to prevent tampering?	Y



H. Evaluation of the Facility's Detection Monitoring Program	Y/N
1. Placement of Downgradient Detection Monitoring Wells	Y
a. Are the ground-water monitoring wells or clusters located immediately adjacent to the waste management area?	Y
b. How far apart are the detection monitoring wells?	100-500'
c. Does the owner/operator provide a rationale for the location of each monitoring well or cluster?	Y
d. Does the owner/operator identified the well screen lengths of each monitoring well or clusters?	N
e. Does the owner/operator provide an explanation for the well screen lengths of each monitoring well or cluster?	N
f. Do the actual locations of monitoring wells or clusters correspond to those identified by the owner/operator?	Y
2. Placement of Upgradient Monitoring Wells	Y
a. Has the owner/operator documented the location of each upgradient monitoring well or cluster?	Y
b. Does the owner/operator provide an explanation for the location(s) of the upgradient monitoring wells?	Y
c. What length screen has the owner/operator employed in the background monitoring well(s)?	?
d. Does the owner/operator provide an explanation for the screen length(s) chosen?	N
e. Does the actual location of each background monitoring well or cluster correspond to that identified by the owner/operator?	Y
I. Office Evaluation of the Facility's Assessment Monitoring Program	Y
1. Does the assessment plan specify:	Y
a. The number, location, and depth of wells?	Y
b. The rationale for their placement and identify the basis that will be used to select subsequent sampling locations and depths in later assessment phases?	Y
2. Does the list of monitoring parameters include all hazardous waste constituents from the facility?	Y

	Y/N
a. Does the water quality parameter list include other important indicators not classified as hazardous waste constituents?	Y
b. Does the owner/operator provide documentation for the listed wastes which are not included?	N
3. Does the owner/operator's assessment plan specify the procedures to be used to determine the rate of constituent migration in the ground-water?	N
4. Has the owner/operator specified a schedule of implementation in the assessment plan?	N
5. Have the assessment monitoring objectives been clearly defined in the assessment plan?	N
a. Does the plan include analysis and/or re-evaluation to determine if significant contamination has occurred in any of the detection monitoring wells?	N
b. Does the plan provide for a comprehensive program of investigation to fully characterize the rate and extent of contaminant migration from the facility?	N
c. Does the plan call for determining the concentrations of hazardous wastes and hazardous waste constituents in the ground water?	N
d. Does the plan employ a quarterly monitoring program?	N
6. Does the assessment plan identify the investigatory methods that will be used in the assessment phase?	Y
a. Is the role of each method in the evaluation fully described?	N
b. Does the plan provide sufficient descriptions of the direct methods to be used?	N
c. Does the plan provide sufficient descriptions of the indirect methods to be used?	N
d. Will the method contribute to the further characterization of the contaminant movement?	Y
7. Are the investigatory techniques utilized in the assessment program based on direct methods?	Y
a. Does the assessment approach incorporate indirect methods to further support direct methods?	N
b. Will the planned methods called for in the assessment approach ultimately meet performance standards for assessment monitoring?	?
c. Are the procedures well defined?	Y
d. Does the approach provide for monitoring wells similar in design and construction as the detection monitoring wells?	Y

e. Does the approach employ taking samples during drilling or collecting core samples for further analysis?	Y/N
8. Are the indirect methods to be used based on reliable and accepted geophysical techniques?	N
a. Are they capable of detecting subsurface changes resulting from contaminant migration at the site?	N/A
b. Is the measurement at an appropriate level of sensitivity to detect ground-water quality changes at the site?	Y
c. Is the method appropriate considering the nature of the subsurface materials?	Y
d. Does the approach consider the limitations of these methods?	Y
e. Will the extent of contamination and constituent concentration be based on direct methods and sound engineering judgment? (Using indirect methods to further substantiate the findings.)	Y
9. Does the assessment approach incorporate any mathematical modeling to predict contaminant movement?	N
a. Will site specific measurements be utilized to accurately portray the subsurface?	?
b. Will the derived data be reliable?	?
c. Have the assumptions been identified?	?
d. Have the physical and chemical properties of the site-specific wastes and hazardous waste constituents been identified?	Y
<b>J. Conclusions</b>	
1. Subsurface geology	
a. Has sufficient data been collected to adequately define petrography and petrographic variation?	Y
b. Has the subsurface geochemistry been adequately defined?	Y
c. Was the boring/logging program adequate to define subsurface geologic variation?	?
d. Was the owner/operator's narrative description complete and accurate in its interpretation of the data?	Y
e. Does the geologic assessment address or provide means to resolve any information gaps?	?
2. Ground-water flowpaths	Y
a. Did the owner/operator adequately establish the horizontal and vertical components of ground-water flow?	

	Y/N
b. Were appropriate methods used to establish ground-water flowpaths?	Y
c. Did the owner/operator provide accurate documentation?	N
d. Are the potentiometric surface measurements valid?	?
e. Did the owner/operator adequately consider the seasonal and temporal effects on the ground-water?	?
f. Were sufficient hydraulic conductivity tests performed to document lateral and vertical variation in hydraulic conductivity in the entire hydrogeologic subsurface below the site?	N
<b>3. Uppermost Aquifer</b>	
a. Did the owner/operator adequately define the upper-most aquifer?	Y
<b>4. Monitoring Well Construction and Design</b>	
a. Do the design and construction of the owner/operator's ground-water monitoring wells permit depth discrete ground-water samples to be taken?	Y
b. Are the samples representative of ground-water quality?	?
c. Are the ground-water monitoring wells structurally stable?	Y
d. Does the ground-water monitoring well's design and construction permit an accurate assessment of aquifer characteristics?	Y
<b>5. Detection Monitoring</b>	
a. Downgradient Wells <ul style="list-style-type: none"> <li>Do the location, and screen lengths of the ground-water monitoring wells or clusters in the detection monitoring system allow the immediate detection of a release of hazardous waste or constituents from the hazardous waste management area to the uppermost aquifer?</li> </ul>	?
b. Upgradient Wells <ul style="list-style-type: none"> <li>Do the location and screen lengths of the upgradient (background) ground-water monitoring wells ensure the capability of collecting ground-water samples representative of upgradient (background) ground-water quality including any ambient heterogeneous chemical characteristics?</li> </ul>	Y
<b>6. Assessment Monitoring</b>	
a. Has the owner/operator adequately characterized site hydrogeology to determine contaminant migration?	Y
b. Is the detection monitoring system adequately designed and constructed to immediately detect any contaminant release?	?

	Y/N
c. Are the procedures used to make a first determination of contamination adequate?	N
d. Is the assessment plan adequate to detect, characterize, and track contaminant migration?	Y
e. Will the assessment monitoring wells, given site hydrogeologic conditions, define the extent and concentration of contamination in the horizontal and vertical planes?	Y
f. Are the assessment monitoring wells adequately designed and constructed?	?
g. Are the sampling and analysis procedures adequate to provide true measures of contamination?	Y
h. Do the procedures used for evaluation of assessment monitoring data result in determinations of the rate of migration, extent of migration, and hazardous constituent composition of the contaminant plume?	N
i. Are the data collected at sufficient frequency and duration to adequately determine the rate of migration?	N
j. Is the schedule of implementation adequate?	N
k. Is the owner/operator's assessment monitoring plan adequate?	N
• If the owner/operator had to implement his assessment monitoring plan, was it implemented satisfactorily?	N
<b>II. Field Evaluation</b>	
<b>A. Ground-Water Monitoring System</b>	
1. Are the numbers, depths, and locations of monitoring wells in agreement with those reported in the facility's monitoring plan? (See Section 3.2.3.)	Y
<b>B. Monitoring Well Construction</b>	
1. Identify construction material material diameter	
a. Primary Casing <u>PVC</u>	
b. Secondary or outside casing <u>STEEL</u>	
2. Is the upper portion of the borehole sealed with concrete to prevent infiltration from the surface?	Y
3. Is the well fitted with an above-ground protective device?	Y
4. Is the protective cover fitted with locks to prevent tampering? If a facility utilizes more than a single well design, answer the above questions for each well design?	Y

	Y/N
<b>III. Review of Sample Collection Procedures</b>	
<b>A. Measurement of Well Depths /Elevation</b>	
1. Are measurements of both depth to standing water and depth to the bottom of the well made?	N
2. Are measurements taken to the 0.01 feet?	N
3. What device is used?	N/A
4. Is there a reference point established by a licensed surveyor?	N/A
5. Is the measuring equipment properly cleaned between well locations to prevent cross contamination?	N
<b>B. Detection of Immiscible Layers</b>	
1. Are procedures used which will detect light phase immiscible layers?	N
2. Are procedures used which will detect heavy phase immiscible layers?	N
<b>C. Sampling of Immiscible Layers</b>	
1. Are the immiscible layers sampled separately prior to well evacuation?	N
2. Do the procedures used minimize mixing with water-soluble phases?	N
<b>D. Well Evacuation</b>	
1. Are low yielding wells evacuated to dryness?	N
2. Are high yielding wells evacuated so that at least three casing volumes are removed?	N
3. What device is used to evacuate the wells?	N/A
4. If any problems are encountered (e.g., equipment malfunction) are they noted in a field logbook?	N

E. Sample Withdrawal	Y/N
1. For low yielding wells, are samples for volatiles, pH, and oxidation/reduction potential drawn first after the well recovers?	N
2. Are samples withdrawn with either fluoro carbon/resins or stainless steel (316, 304 or 2205) sampling devices?	N
3. Are sampling devices either bottom valve bailers or positive gas displacement bladder pumps?	N
4. If bailers are used, is fluorocarbon/resin coated wire, single strand stainless steel wire, or monofilament used to raise and lower the bailer?	N
5. If bladder pumps are used, are they operated in a continuous manner to prevent aeration of the sample?	N
6. If bailers are used, are they lowered slowly to prevent degassing of the water?	N
7. If bailers are used, are the contents transferred to the sample container in a way that minimizes agitation and aeration?	N
8. Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior to insertion into the well?	N
9. If dedicated sampling equipment is not used, is equipment disassembled and thoroughly cleaned between samples?	N
10. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps: a. Dilute acid rinse (HNO <sub>3</sub> or HCl)? 11. If samples are for organic analysis, does the cleaning procedure include the following sequential steps:	N
11. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps: a. Nonphosphate detergent wash?	N
b. Tap water rinse?	N
c. Distilled/deionized water rinse?	N
d. Acetone rinse?	N
e. Pesticide-grade hexane rinse?	N

	Y/N
12. Is sampling equipment thoroughly dry before use?	N
13. Are equipment blanks taken to ensure that sample cross-contamination has not occurred?	N
14. If volatile samples are taken with a positive gas displacement bladder pump, are pumping rates below 100 ml/min?	N
<b>F. In-situ or Field Analyses</b>	
1. Are the following labile (chemically unstable) parameters determined in the field:	N
a. pH?	N
b. Temperature?	N
c. Specific conductivity?	N
d. Redox potential?	N
e. Chlorine?	N
f. Dissolved oxygen?	N
g. Turbidity?	N
h. Other (specify) _____	N
2. For in-situ determinations, are they made after well evacuation and sample removal?	N
3. If sample is withdrawn from the well, is parameter measured from a split portion?	N
4. Is monitoring equipment calibrated according to manufacturers' specifications and consistent with SW-846?	N
5. Is the date, procedure, and maintenance for equipment calibration documented in the field logbook?	N
<b>IV. Review of Sample Preservation and Handling Procedures</b>	
<b>A. Sample Containers</b>	
1. Are samples transferred from the sampling device directly to their compatible containers?	N



	Y/N
2. Are sample containers for metals (inorganics) analyses polyethylene with polypropylene caps?	N
3. Are sample containers for organics analysis glass bottles with fluorocarbonresin-lined caps?	N
4. If glass bottles are used for metals samples are the caps fluorocarbonresin-lined?	N
5. Are the sample containers for metal analyses cleaned using these sequential steps:	N
a. Nonphosphate detergent wash?	
b. 1:1 nitric acid rinse?	N
c. Tap water rinse?	N
d. 1:1 hydrochloric acid rinse?	
e. Tap water rinse?	N
f. Distilled/deionized water rinse?	N
6. Are the sample containers for organic analyses cleaned using these sequential steps:	N
a. Nonphosphate detergent/hot water wash?	
b. Tap water rinse?	N
c. Distilled/deionized water rinse?	N
d. Acetone rinse?	N
e. Pesticide-grade hexane rinse?	N
7. Are trip blanks used for each sample container type to verify cleanliness?	N
<b>B. Sample Preservation Procedures</b>	
1. Are samples for the following analyses cooled to 4°C:	N
a. TOC?	
b. TOX?	
c. Chloride?	
d. Phenols?	N
e. Sulfate?	N
f. Nitrate?	N
g. Coliform bacteria?	N
h. Cyanide?	N
i. Oil and grease?	N
j. Hazardous constituents (1261, Appendix VIII)?	N

	Y/N
2. Are samples for the following analyses field acidified to pH < 2 with HNO <sub>3</sub> :	
a. Iron?	N
b. Manganese?	
c. Sodium?	N
d. Total metals?	N
e. Dissolved metals?	N
f. Fluoride?	N
g. Endrin?	N
h. Lindane?	N
i. Methoxychlor?	N
j. Toxaphene?	N
k. 2,4, D?	N
l. 2,4,5 TP Silver?	N
m. Radium?	N
n. Gross alpha?	N
o. Gross beta?	N
3. Are samples for the following analyses field acidified to pH < 2 with H <sub>2</sub> SO <sub>4</sub> :	
a. Phenols?	N
b. Oil and grease?	
4. Is the sample for TOC analyses field acidified to pH < 2 with HCl?	N
5. Is the sample for TOX analysis preserved with 1 ml of 1.1 M sodium sulfide?	N
6. Is the sample for cyanide analysis preserved with NaOH to pH > 12?	N
<b>C. Special Handling Considerations</b>	
1. Are organic samples handled without filtering?	N
2. Are samples for volatile organics transferred to the appropriate vials to eliminate headspace over the sample?	N
3. Are samples for metal analysis split into two portions?	N
4. Is the sample for dissolved metals filtered through a 0.45 micron filter?	N
5. Is the second portion not filtered and analyzed for total metals?	N
6. Is one equipment blank prepared each day of ground-water sampling?	N

V. Review of Chain-of-Custody Procedures	Y/N
A. Sample Labels	
1. Are sample labels used?	N
2. Do they provide the following information:	
a. Sample identification number?	N
b. Name of collector?	
c. Date and time of collection?	N
d. Place of collection?	N
e. Parameter(s) requested and preservatives used?	N
3. Do they remain legible even if wet?	N
B. Sample Seals	
1. Are sample seals placed on those containers to ensure samples are not altered?	N
C. Field Logbook	
1. Is a field logbook maintained?	N
2. Does it document the following:	
a. Purpose of sampling (e.g., detection or assessment)?	N
b. Location of well(s)?	N
c. Total depth of each well?	N
d. Static water level depth and measurement technique?	N
e. Presence of immiscible layers and detection method?	N
f. Collection method for immiscible layers and sample identification numbers?	N
g. Well evacuation procedures?	N
h. Sample withdrawal procedures?	N
i. Date and time of collection?	N
j. Well sampling sequence?	N
k. Types of sample containers and sample identification number(s)?	N
l. Preservative(s) used?	N
m. Parameters requested?	N
n. Field analysis data and method(s)?	N
o. Sample distribution and transporter?	N
p. Field observations?	N

—Unusual well recharge rates?	Y/N
—Equipment malfunction(s)?	N
—Possible sample contamination?	N
—Sampling rate?	N
<b>D. Chain-of-Custody Record</b>	
1. Is a chain-of-custody record included with each sample?	N
2. Does it document the following:	
a. Sample number?	N
b. Signature of collector?	N
c. Date and time of collection?	N
d. Sample type?	N
e. Station location?	N
f. Number of containers?	N
g. Parameters requested?	N
h. Signatures of persons involved in chain-of-custody?	N
i. Inclusive dates of custody?	N
<b>E. Sample Analysis Request Sheet</b>	
1. Does a sample analysis request sheet accompany each sample?	N
2. Does the request sheet document the following:	
a. Name of person receiving the sample?	N
b. Date of sample receipt?	N
c. Duplicates?	N
d. Analysis to be performed?	N
<b>IV. Review of Quality Assurance/Quality Control</b>	
A. Is the validity and reliability of the laboratory and field generated data ensured by a QA/QC program?	N
B. Does the QA/QC program include:	
1. Documentation of any deviation from approved procedures?	N

	Y/N
2. Documentation of analytical results for:	
a. Blanks?	N
b. Standards?	N
c. Duplicates?	N
d. Spiked samples?	N
e. Detectable limits for each parameter being analyzed?	N
C. Are approved statistical methods used?	N
D. Are QC samples used to correct data?	N
E. Are all data critically examined to ensure it has been properly calculated and reported?	N
<b>VII. Surficial Well Inspection and Field Observation</b>	
A. Are the wells adequately maintained?	Y
B. Are the monitoring wells protected and secure?	N
C. Do the wells have surveyed casing elevations?	Y
D. Are the ground-water samples turbid?	?
E. Have all physical characteristics of the site been noted in the inspector's field notes (i.e., surface waters, topography, surface features)?	Y
F. Has a site sketch been prepared by the field inspector with scale, north arrow, location(s) of buildings, location(s) of regulated units, locations of monitoring wells, and a rough depiction of the site drainage pattern?	Y

	Y/N
<b>VIII. Conclusions</b>  <b>A. Is the facility currently operating under the correct monitoring program according to the statistical analyses performed by the current operator?</b>	N
<b>B. Does the ground-water monitoring system, as designed and operated, allow for detection or assessment of any possible ground-water contamination caused by the facility?</b>	N
<b>C. Does the sampling and analysis procedures permit the owner/operator to detect and, where possible, assess the nature and extent of a release of hazardous constituents to ground water from the monitored hazardous waste management facility?</b>	N

**Figure 4.3**

## Relationship of Technical Inadequacies to Ground-Water Performance Standards

Examples of Basic Elements Required by Performance Standards	Examples of Technical Inadequacies that may Constitute Violations	Regulatory Citations
1. Uppermost Aquifer must be correctly identified.	<ul style="list-style-type: none"> <li>• failure to consider aquifers hydraulically interconnected to the uppermost aquifer.</li> <li>• incorrect identification of certain formations as confining layers or aquitards.</li> <li>• failure to use test drilling and/or soil borings to characterize subsurface hydrogeology.</li> </ul>	<p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p> <p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p> <p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p>
2. Ground-water flow directions and rates must be properly determined.	<ul style="list-style-type: none"> <li>• failure to use piezometers or wells to determine ground-water flow rates and directions (or failure to use a sufficient number of them).</li> <li>• failure to consider temporal variations in water levels when establishing flow directions (e.g., seasonal variations, short-term fluctuations due to pumping).</li> <li>• failure to assess significance of vertical gradients when evaluating flow rates and directions.</li> <li>• failure to use standard/consistent benchmarks when establishing water level elevations.</li> <li>• failure of the owner/operator (o/o) to consider the effect of local withdrawal wells on ground-water flow direction.</li> <li>• failure of the o/o to obtain sufficient water level measurements.</li> </ul>	<p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p> <p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p> <p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p> <p>§265.90(a) §265.91(a)(1, 2) §270.14(c)(2)</p> <p>§265.90(a) §265.91(a)(1)</p> <p>§265.90(a) §265.91(a)(1)</p>

3. Background wells must be located so as to yield samples that are not affected by the facility.	<ul style="list-style-type: none"> <li>• failure of the o/o to consider the effect of local withdrawal wells on ground-water flow direction.</li> <li>• failure of the o/o to obtain sufficient water level measurements.</li> <li>• failure of the o/o to consider flow path of dense immiscibles in establishing upgradient well locations.</li> <li>• failure of the o/o to consider seasonal fluctuations in ground-water flow direction.</li> <li>• failure to install wells hydraulically upgradient, except in cases where upgradient water quality is affected by the facility (e.g., migration of dense immiscibles in the upgradient direction, mounding water beneath the facility).</li> <li>• failure of the o/o to adequately characterize subsurface hydrogeology.</li> <li>• wells intersect only ground water that flows around facility.</li> </ul>	<p>§265.90(a) §265.91(a)(1)</p> <p>§265.90(a) §265.91(a)(1)</p> <p>§265.90(a) §265.91(a)(1)</p> <p>§265.90(a) §265.91(a)(1)</p> <p>§265.90(a) §265.91(a)(1)</p> <p>§265.90(a) §265.91(a)(1)</p>
4. Background wells must be constructed so as to yield samples that are representative of in-situ ground-water quality.	<ul style="list-style-type: none"> <li>• wells constructed of materials that may release or absorb constituents of concern</li> <li>• wells improperly sealed—contamination of sample is a concern.</li> <li>• nested or multiple screen wells are used and it cannot be demonstrated that there has been no movement of ground water between strata.</li> </ul>	<p>§265.90(a) §265.91(a)</p> <p>§265.90(a) §265.91(a), (c)</p> <p>§265.90(a) §265.91(a)(1, 2)</p>



**Examples of Basic Elements Required by Performance Standards**

**Examples of Technical Inadequacies that may Constitute Violations**

**Regulatory Citations**

4. Background wells must be constructed so as to yield samples that are representative of in-situ ground-water quality.  
(Continued)

- improper drilling methods were used, possibly contaminating the formation.
- well intake packed with materials that may contaminate sample.
- well screens used are of an inappropriate length.
- wells developed using water other than formation water.
- improper well development yielding samples with suspended sediments that may bias chemical analysis.
- use of drilling muds or nonformation water during well construction that can bias results of samples collected from wells.

§265.90(a)  
§265.91(a)  
  
§265.90(a)  
§265.91(a), (c)  
  
§265.90(a)  
§265.91(a)(1, 2)

5. Downgradient monitoring wells must be located so as to ensure the immediate detection of any contamination migrating from the facility.

- wells not placed immediately adjacent to waste management area.
- failure of o/o to consider potential pathways for dense immiscibles.
- inadequate vertical distribution of wells in thick or heavily stratified aquifer.
- inadequate horizontal distribution of wells in aquifers of varying hydraulic conductivity.
- likely pathways of contamination (e.g., buried streams channels, fractures, areas of high permeability) are not intersected by wells.
- well network covers uppermost but not interconnected aquifers.

§265.90(a)  
§265.91(a)(2)  
  
§265.90(a)  
§265.91(a)(2)  
  
§265.90(a)  
§265.91(a)(2)  
  
§265.90(a)  
§265.91(a)(2)  
  
§265.90(a)  
§265.91(a)(2)

6. Downgradient monitoring wells must be constructed so as to yield samples that are representative of in-situ ground-water quality.

See No. 4 above.

7. Samples from background and downgradient wells must be properly collected and analyzed.

- failure to evacuate stagnant water from the well before sampling.

§265.90(a), §265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

- failure to sample wells within a reasonable amount of time after well evacuation.

§265.90(a)  
§265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

- improper decisions regarding filtering or non-filtering of samples prior to analysis (e.g., use of filtration on samples to be analyzed for volatile organics).

§265.90(a)  
§265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

- use of an inappropriate sampling device.

§265.90(a)  
§265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

- use of improper sample preservation techniques.

§265.90(a)  
§265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

7. Samples from background and downgradient wells must be properly collected and analyzed.  
(Continued)

- |   |  |
|---|--|
| • samples collected with a device that is constructed of materials that interfere with sample integrity.  | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • samples collected with a non-dedicated sampling device that is not cleaned between sampling events.   | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • improper use of a sampling device such that sample quality is affected (e.g., degassing of sample caused by agitation of bailer).                   | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • improper handling of samples (e.g., failure to eliminate headspace from containers of samples to be analyzed for volatiles).                        | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • failure of the sampling plan to establish procedures for sampling immiscibles (i.e., "floaters" and "sinkers").                                     | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • failure to follow appropriate QA/QC procedures.   | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • failure to ensure sample integrity through the use of proper chain-of-custody procedures.   | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • failure to demonstrate suitability of methods used for sample analysis (other than those specified in SW-846).                                      | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |
| • failure to perform analysis in the field on unstable parameters or constituents (e.g., pH, Eh, specific conductance, alkalinity, dissolved oxygen). | §265.90(a)<br>§265.92(a)<br>§265.93(d)(4)<br>§270.14(c)(4) |

**Elements Required by  
Performance Standards****Examples of Technical Inadequacies  
that may Constitute Violations****Regulatory Citations**

7. Samples from  
background and  
downgradient  
wells must be  
properly collected  
and analyzed.  
(Continued)

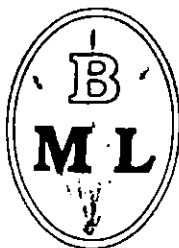
- use of sample containers that may interfere with sample quality (e.g., synthetic containers used with volatile samples).

§265.90(a)  
§265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

- failure to make proper use of sample blanks.

§265.90(a)  
§265.92(a)  
§265.93(d)(4)  
§270.14(c)(4)

## Appendix B (Analytical Results)



# BLUE MARSH LABORATORY, INC.

85 Benjamin Franklin Highway  
Douglassville, PA 19518  
Phone (610) 327-8196  
FAX (610) 327-6864

**Certifications:**  
NJ DEPE Cert #77925  
PA DEP Cert #06-409

## Client Information:

**Boyertown Sanitary Disposal Facility,**  
**1705 Pottstown Pike,**  
**Glennmoore, PA 19343**

Attn: Byron Wenger

BML Lot No: 858

Number of Samples: 10

Date Submitted: **4/24/97**

Sample Matrix: Water

## Sample Information:

**Project: BOYERTOWN MONITORING WELLS (ANNUAL)**

Permit No: 100550

Date Sampled: 04/11/97

Sampled by: J.Diamadi/G.Marshall

## Lab ID No:

## Sample ID:

9704-2797	.....	SMW-1
9704-2798	.....	AMW-6
9704-2799	.....	AMW-1
9704-2800	.....	AMW-9
9704-2801	.....	AMW-10
9704-2802	.....	AMW-12
9704-2803	.....	AMW-11
9704-2804	.....	AMW-7
9704-2805	.....	AMW-8
9704-2806	.....	AMW-5

## Contents of Report:

Cover Page  
Analytical Results  
Chain of Custody  
Verification

# **BLUE MARSH LABORATORY, INC.**

85 Benjamin Franklin Highway

Douglasville, PA 19518

Phone: (610) 327-8196

Fax: (610) 327-6864

## **ANALYTICAL RESULTS**

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2797
Monitoring Point No.	SMW-1
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	15.	H8000
3. (00940) Chloride	270.	300.0
4. (00980) Iron (ug/l) Total	310.	200.7
5. (01123) Manganese (ug/l) Total	1050.	200.7
6. (00620) Nitrate-Nitrogen	1.7	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.06	150.1
9. (00923) Sodium Total	89.7	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	1562.	120.1
12. (00680) Total Organic Carbon	57.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	2.6	180.1



# BLUE MARSH LABORATORY, INC.

ID No.	9704-2797
Monitoring Point No.	SMW-1
Sample Date	04/11/97

## **FORM 19** **QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

### **ANALYTES**

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2797
Monitoring Point No.	SMW-1
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	33.	300.0
32. (00410) Total Alkalinity	432.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	<5.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	489.	200.8
36. (01005) Barium, Dissolved	347.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	<5.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	15.	200.8
42. (01040) Copper, Dissolved	13.	200.8
43. (01114) Lead, Total	<5.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	45600.	200.7
46. (00925) Magnesium, Dissolved	48600.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	1400.	200.7
50. (00935) Potassium, Dissolved	1200.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	49.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2797
Monitoring Point No.	SMW-1
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2798
Monitoring Point No.	AMW-6
Sample Date	04/11/97

## **FORM 19** **QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

### **ANALYTES**

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	15.	H8000
3. (00940) Chloride	10.1	300.0
4. (00980) Iron (ug/l) Total	16300.	200.7
5. (01123) Manganese (ug/l) Total	720.	200.7
6. (00620) Nitrate-Nitrogen	4.5	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.68	150.1
9. (00923) Sodium Total	13.0	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	507.	120.1
12. (00680) Total Organic Carbon	19.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	3230.	180.1

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2798
Monitoring Point No.	AMW-6
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2798
Monitoring Point No.	AMW-6
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	27.	300.0
32. (00410) Total Alkalinity	224.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	9.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	938.	200.8
36. (01005) Barium, Dissolved	347.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	9.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	55.	200.8
42. (01040) Copper, Dissolved	10.	200.8
43. (01114) Lead, Total	27.	200.8
44. (01049) Lead, Dissolved	6.	200.8
45. (00921) Magnesium, Total	26200.	200.7
46. (00925) Magnesium, Dissolved	22380.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	6100.	200.7
50. (00935) Potassium, Dissolved	5200.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	76.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2798
Monitoring Point No.	AMW-6
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2799
Monitoring Point No.	AMW-1
Sample Date	04/11/97

## **FORM 19** **QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

### **ANALYTES**

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	5.	H8000
3. (00940) Chloride	65.	300.0
4. (00980) Iron (ug/l) Total	<50.	200.7
5. (01123) Manganese (ug/l) Total	<50.	200.7
6. (00620) Nitrate-Nitrogen	2.7	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.37	150.1
9. (00923) Sodium Total	15.0	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	748.	120.1
12. (00680) Total Organic Carbon	31.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	1.1	180.1



# BLUE MARSH LABORATORY, INC.

ID No.	9704-2799
Monitoring Point No.	AMW-1
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	12.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	28.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2799
Monitoring Point No.	AMW-1
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	18.	300.0
32. (00410) Total Alkalinity	283.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	<5.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	698.	200.8
36. (01005) Barium, Dissolved	700.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	<5.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	13.	200.8
42. (01040) Copper, Dissolved	10.	200.8
43. (01114) Lead, Total	<5.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	38300.	200.7
46. (00925) Magnesium, Dissolved	39900.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	1100.	200.7
50. (00935) Potassium, Dissolved	300.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	515.	200.8
56. (01090) Zinc, Dissolved	506.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2799
Monitoring Point No.	AMW-1
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2800
Monitoring Point No.	AMW-9
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	5.	H8000
3. (00940) Chloride	5.2	300.0
4. (00980) Iron (ug/l) Total	20700.	200.7
5. (01123) Manganese (ug/l) Total	1300.	200.7
6. (00620) Nitrate-Nitrogen	1.0	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.40	150.1
9. (00923) Sodium Total	8.0	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	390.	120.1
12. (00680) Total Organic Carbon	15.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	2740.	180.1

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2800
Monitoring Point No.	AMW-9
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2800
Monitoring Point No.	AMW-9
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	0.2	300.0
31. (00945) Sulfate	20.	300.0
32. (00410) Total Alkalinity	176.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	7.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	1020.	200.8
36. (01005) Barium, Dissolved	176.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	15.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	128.	200.8
42. (01040) Copper, Dissolved	10.	200.8
43. (01114) Lead, Total	23.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	20600.	200.7
46. (00925) Magnesium, Dissolved	12800.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	4400.	200.7
50. (00935) Potassium, Dissolved	800.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	113.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2800
Monitoring Point No.	AMW-9
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2801
Monitoring Point No.	AMW-10
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	5.	H8000
3. (00940) Chloride	2.2	300.0
4. (00980) Iron (ug/l) Total	35500.	200.7
5. (01123) Manganese (ug/l) Total	1780.	200.7
6. (00620) Nitrate-Nitrogen	0.5	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.21	150.1
9. (00923) Sodium Total	7.5	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	266.	120.1
12. (00680) Total Organic Carbon	19.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	2215.	180.1



# BLUE MARSH LABORATORY, INC.

ID No.	9704-2801
Monitoring Point No.	AMW-10
Sample Date	04/11/97

## FORM 19

### QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

#### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2801
Monitoring Point No.	AMW-10
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	20.	300.0
32. (00410) Total Alkalinity	132.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	18.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	3088.	200.8
36. (01005) Barium, Dissolved	176.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	24.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	92.	200.8
42. (01040) Copper, Dissolved	9.	200.8
43. (01114) Lead, Total	18.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	18600	200.7
46. (00925) Magnesium, Dissolved	12800.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	4600.	200.7
50. (00935) Potassium, Dissolved	200.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	122.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2801
Monitoring Point No.	AMW-10
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2802
Monitoring Point No.	AMW-12
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	10.	H8000
3. (00940) Chloride	5.6	300.0
4. (00980) Iron (ug/l) Total	2890.	200.7
5. (01123) Manganese (ug/l) Total	4960.	200.7
6. (00620) Nitrate-Nitrogen	0.6	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.68	150.1
9. (00923) Sodium Total	8.0	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	427.	120.1
12. (00680) Total Organic Carbon	11.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	169.	180.1

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2802
Monitoring Point No.	AMW-12
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2802
Monitoring Point No.	AMW-12
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	30.	300.0
32. (00410) Total Alkalinity	196.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	7.	200.8
34. (01000) Arsenic, Dissolved	5.	200.8
35. (01009) Barium, Total	747.	200.8
36. (01005) Barium, Dissolved	147.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	<5.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	22.	200.8
42. (01040) Copper, Dissolved	8.	200.8
43. (01114) Lead, Total	<5.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	13400.	200.7
46. (00925) Magnesium, Dissolved	13200.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	1000.	200.7
50. (00935) Potassium, Dissolved	600.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	30.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2802
Monitoring Point No.	AMW-12
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2803
Monitoring Point No.	AMW-11
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	5.	H8000
3. (00940) Chloride	3.7	300.0
4. (00980) Iron (ug/l) Total	16400.	200.7
5. (01123) Manganese (ug/l) Total	620.	200.7
6. (00620) Nitrate-Nitrogen	1.1	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.07	150.1
9. (00923) Sodium Total	7.9	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	327.	120.1
12. (00680) Total Organic Carbon	15.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	1345.	180.1



# BLUE MARSH LABORATORY, INC.

ID No.	9704-2803
Monitoring Point No.	AMW-11
Sample Date	04/11/97

## FORM 19

### QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

#### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2803
Monitoring Point No.	AMW-11
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	21.	300.0
32. (00410) Total Alkalinity	140.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	9.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	846.	200.8
36. (01005) Barium, Dissolved	296.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	8.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	43.	200.8
42. (01040) Copper, Dissolved	9.	200.8
43. (01114) Lead, Total	13.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	10700.	200.7
46. (00925) Magnesium, Dissolved	6200.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	3200.	200.7
50. (00935) Potassium, Dissolved	1100.	200.7
51. (00981) Selenium, Total	29.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	69.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2803
Monitoring Point No.	AMW-11
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2804
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	<0.1	350.3
2. (00340) Chemical Oxygen Demand	10.	H8000
3. (00940) Chloride	53.	300.0
4. (00980) Iron (ug/l) Total	4140.	200.7
5. (01123) Manganese (ug/l) Total	410.	200.7
6. (00620) Nitrate-Nitrogen	2.3	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.26	150.1
9. (00923) Sodium Total	21.2	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	573.	120.1
12. (00680) Total Organic Carbon	16.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	159.	180.1

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2804
Monitoring Point No.	AMW-8
Sample Date	04/11/97

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2804
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	20.	300.0
32. (00410) Total Alkalinity	196.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	6.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	440.	200.8
36. (01005) Barium, Dissolved	357.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	<5.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	14.	200.8
42. (01040) Copper, Dissolved	11.	200.8
43. (01114) Lead, Total	<5.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	20600.	200.7
46. (00925) Magnesium, Dissolved	19000.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	2000.	200.7
50. (00935) Potassium, Dissolved	<100.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	43.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2804
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2805
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	0.1	350.3
2. (00340) Chemical Oxygen Demand	20.	H8000
3. (00940) Chloride	92.	300.0
4. (00980) Iron (ug/l) <span style="float: right;">Total</span>	8270.	200.7
5. (01123) Manganese (ug/l) <span style="float: right;">Total</span>	140.	200.7
6. (00620) Nitrate-Nitrogen	1.5	300.0
7. (00403) <span style="float: right;">Field</span> pH (std units)		
8. <span style="float: right;">Laboratory</span>	7.39	150.1
9. (00923) Sodium <span style="float: right;">Total</span>	15.0	200.7
10. (00095) <span style="float: right;">Field</span> Specific Conductivity (uS)		
11. <span style="float: right;">Laboratory</span>	831.	120.1
12. (00680) Total Organic Carbon	18.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	280.	180.1



# BLUE MARSH LABORATORY, INC.

ID No.	9704-2805
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2805
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	14.	300.0
32. (00410) Total Alkalinity	284.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	8.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	1280.	200.8
36. (01005) Barium, Dissolved	1040.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	6.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	17.	200.8
42. (01040) Copper, Dissolved	9.	200.8
43. (01114) Lead, Total	9.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	44500.	200.7
46. (00925) Magnesium, Dissolved	42000.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	2900.	200.7
50. (00935) Potassium, Dissolved	1000.	200.7
51. (00981) Selenium, Total	9.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	76.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2805
Monitoring Point No.	AMW-8
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2806
Monitoring Point No.	AMW-5
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

1. Inorganics (Enter all data in mg/l except as noted)

STORET NO ANALYTE	VALUE	METHOD NUMBER
1. (00610) Ammonia-Nitrogen	<0.1	350.3
2. (00340) Chemical Oxygen Demand	15.	H8000
3. (00940) Chloride	11.1	300.0
4. (00980) Iron (ug/l) Total	9380.	200.7
5. (01123) Manganese (ug/l) Total	710.	200.7
6. (00620) Nitrate-Nitrogen	3.8	300.0
7. (00403) Field pH (std units)		
8. Laboratory	7.53	150.1
9. (00923) Sodium Total	12.7	200.7
10. (00095) Field 11. Specific Conductivity (uS)		
Laboratory	542.	120.1
12. (00680) Total Organic Carbon	46.	415.1
13. (32730) Total Phenolics (ug/l)	<20.	420.1
14. (82079) Turbidity (NTU)	800.	180.1

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2806
Monitoring Point No.	AMW-5
Sample Date	04/11/97

## FORM 19 QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

### ANALYTES

2. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
15. (78124) Benzene	<1.	8260A
16. (77651) 1,2-Dibromoethane	<1.	8260A
17. (34496) 1,1-Dichloroethane	<1.	8260A
18. (34501) 1,1-Dichloroethene	<1.	8260A
19. (34531) 1,2-Dichloroethane	<1.	8260A
20. (77093) Cis-1,2-Dichloroethene	<1.	8260A
21. (34546) Trans-1,2-Dichloroethene	<1.	8260A
22. (34371) Ethylbenzene	<1.	8260A
23. (34423) Methylene chloride	<1.	8260A
24. (34475) Tetrachloroethene	<1.	8260A
25. (78131) Toluene	<1.	8260A
26. (34506) 1,1,1-Trichloroethane	<1.	8260A
27. (39180) Trichloroethene	<1.	8260A
28. (39175) Vinyl chloride	<1.	8260A
29. (81551) Xylene	<1.	8260A

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2806
Monitoring Point No.	AMW-5
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 1. Inorganics (Enter all data in mg/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
30. (00951) Fluoride	<0.2	300.0
31. (00945) Sulfate	23.	300.0
32. (00410) Total Alkalinity	242.	310.1

### 2. Metals (Enter all data in ug/l) If initial background analyses or four consecutive annual analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses are not required.

33. (00978) Arsenic, Total	<5.	200.8
34. (01000) Arsenic, Dissolved	<5.	200.8
35. (01009) Barium, Total	643.	200.8
36. (01005) Barium, Dissolved	380.	200.8
37. (01113) Cadmium, Total	<5.	200.8
38. (01025) Cadmium, Dissolved	<5.	200.8
39. (01118) Chromium, Total	13.	200.8
40. (01030) Chromium, Dissolved	<5.	200.8
41. (01119) Copper, Total	47.	200.8
42. (01040) Copper, Dissolved	10.	200.8
43. (01114) Lead, Total	23.	200.8
44. (01049) Lead, Dissolved	<5.	200.8
45. (00921) Magnesium, Total	31700.	200.7
46. (00925) Magnesium, Dissolved	28400.	200.7
47. (71901) Mercury, Total	<0.002	7470A
48. (71890) Mercury, Dissolved	<0.002	7470A
49. (00939) Potassium, Total	3100.	200.7
50. (00935) Potassium, Dissolved	<100.	200.7
51. (00981) Selenium, Total	<5.	200.8
52. (01145) Selenium, Dissolved	<5.	200.8
53. (01079) Silver, Total	<5.	200.8
54. (01075) Silver, Dissolved	<5.	200.8
55. (01094) Zinc, Total	84.	200.8
56. (01090) Zinc, Dissolved	<5.	200.8

# BLUE MARSH LABORATORY, INC.

ID No.	9704-2806
Monitoring Point No.	AMW-5
Sample Date	04/11/97

## FORM 19 ANNUAL WATER QUALITY ANALYSES

### 3. Organics (Enter all data in ug/l)

STORET NO ANALYTE	VALUE	METHOD NUMBER
57. (32104) Bromoform	<1.	8260A
58. (34413) Bromomethane	<1.	8260A
59. (32102) Carbon tetrachloride	<1.	8260A
60. (34301) Chlorobenzene	<1.	8260A
61. (34311) Chloroethane	<1.	8260A
62. (32105) Dibromochloromethane	<1.	8260A
63. (34418) Methyl Chloride	<1.	8260A
64. (78109) 3-Chloro-1-propene	<1.	8260A
65. (34536) 1,2-Dichlorobenzene	<1.	8260A
66. (34566) 1,3-Dichlorobenzene	<1.	8260A
67. (34571) 1,4-Dichlorobenzene	<1.	8260A
68. (34668) Dichlorodifluoromethane	<1.	8260A
69. (34531) x,y-Dichloropropane (Propylene dichloride)	<1.	8260A
70. (34704) Cis-1,3-Dichloropropene	<1.	8260A
71. (34699) Trans-1,3-Dichloropropene	<1.	8260A
72. (81595) Methyl Ethyl Ketone	<1.	8260A
73. (78133) 4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	<1.	8260A
74. (77562) 1,1,1,2-Tetrachloroethane	<1.	8260A
75. (34516) 1,1,2,2-Tetrachloroethane	<1.	8260A
76. (34511) 1,1,2-Trichloroethane	<1.	8260A
77. (34488) Trichlorofluoromethane (CFC-11)	<1.	8260A
78. (77443) 1,2,3-Trichloropropane	<1.	8260A

# **BLUE MARSH LABORATORY, INC.**

**85 Benjamin Franklin Highway**

**Douglassville, PA 19518**

**Phone: (610) 327-8196**

**Fax: (610) 327-6864**

## **CHAIN OF CUSTODY FORMS**



**BLUE MARSH LABORATORY, INC.**  
85 Benjamin Franklin Highway  
Douglassville, PA 19518  
Phone: (610) 327-8196 Fax: (610) 327-6864

# CHAIN OF CUSTODY RECORD

Send Report to:	Boyer, San Diego
Contact:	Byron Wenger
Phone#:	458-5300
Fax#:	

[illegible]

\* Surcharge for 24 HR, 48 HR, 72 HR, and 1 week turnaround times.

**\*\* Specify method required.**

\*\*\* Surcharges may apply.

BML/



**BLUE MARSH LABORATORY, INC.**

85 Benjamin Franklin Highway  
Douglassville, PA 19518  
(610) 327-8196

**VERIFICATION FORM**

Client: Boyertown Sanitary Disposal Facility

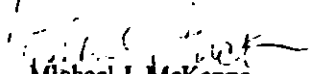
Date Submitted: 11-Apr-97

Date Completed: 24-Apr-97

BML Lot No: 858

This report has been reviewed and approved by the person(s) signed below.  
The report is accurate to the best of our knowledge.

Sincerely,

  
Michael J. McKenna  
Laboratory Director

## Appendix C (Correspondence)

**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**In the Matter of:**

Boyertown Sanitary Disposal Co., Inc.

and

Mr. Warren K. Frame

: Municipal and Hazardous Waste Landfill  
Violations  
: ~~Boyertown Sanitary Landfill~~  
: Permit No. 100550  
: EPA ID Number PAD048603005  
: Douglass Township  
: Montgomery County

**ORDER**

NOW, This ~~25th day of March, 1997~~, the Commonwealth of Pennsylvania, Department of Environmental Protection (hereinafter the "Department"), has determined that:

A. The Department is the agency with the duty and authority to administer and enforce the Solid Waste Management Act, Act of July 7, 1980, P.L. 380, as amended 35 P.S. § 6018.101 et seq. ("SWMA"); the Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. § 691.1 et seq. ("CSL"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, as amended, 71 P.S. § 510-17 ("Administrative Code") and the rules and regulations promulgated thereunder.

B. Boyertown is a corporation qualified to do business in Pennsylvania and maintains a business address of RD 1, Box 360, Glenmoore, PA 19343.

C. Boyertown owns and operates Boyertown Sanitary Landfill ("Boyertown Landfill" or "the landfill"), a closed municipal waste and hazardous waste disposal facility located at 300 Merkel Road, Gilbertsville, Douglass Township, Montgomery County, Pennsylvania.

D. Mr. Warren K. Frame ("Frame") is an individual who is CEO of Boyertown Landfill and has been in charge of the day to day operation of the landfill from at least August of 1984 to the present.

E. The leachate generated by the landfill constitutes hazardous waste under the SWMA, and an 'industrial waste' and/or a "polluting substance" under the CSL.

F. The landfill is identified by US EPA identification number PAD048603005.

G. Inspections conducted by the Department on March 8 and 17, 1995 revealed that Boyertown and/or Frame failed to maintain two feet of freeboard in the raw leachate surface impoundment as a means to prevent any overtopping of the dike by overfilling, wave action or a storm. Boyertown and/or Frame also failed to maintain and monitor the leachate collection, removal, and treatment system to prevent excess accumulation of leachate in the system. This is a violation of 25 PA. Code §§265.222 and 265.310(c)(3).

H. On March 22, 1995 the Department issued a Compliance Order to Boyertown and Frame concerning the unpermitted discharge of hazardous waste leachate from the raw leachate surface impoundment. The Order required Boyertown and/or Frame to achieve and maintain a minimum freeboard of two feet in the raw, untreated hazardous waste leachate surface impoundment. A copy of the Compliance Order is attached hereto as Appendix A.

I. The Department's Compliance Order was not appealed. The findings of fact and conclusions of law in the Compliance Order are incorporated as if fully set forth herein.

J. Inspections conducted by the Department on April 3, 13, 25, May 2 and 4, 1995 revealed that Boyertown had failed to achieve and maintain a minimum freeboard of two (2) feet in the raw, untreated hazardous waste leachate surface impoundment. This is a violation of the Corrective Action Required or Activity to be Ceased paragraphs in the March 22, 1995 Compliance Order and 35 P.S. § 6018.603.

K. Boyertown and/or Frame have failed to conduct quarterly groundwater monitoring at the landfill for the four quarters of 1993, the four quarters of 1994, the four quarters of 1995, and the first three quarters of 1996. This is a violation of 25 PA. Code §§ 265.92(e)(2) and 265.310 (c)(2), of the Hazardous Waste Regulations; and/or 25 PA Code §§ 273.284 and 273.201(c), of the Municipal Waste Regulations; and condition number 2 of Boyertown's Solid Waste Management Permit No. 100550.

L. Department inspections conducted at the landfill on October 20 and 23, 1995, and on February 14, May 2, and September 13, of 1996, revealed that Boyertown is recirculating leachate back into the landfill through a hole excavated into the cap of the landfill. This is a violation of 25 PA. Code §§ 264.305(13), 265.310 (c)(1), of the Hazardous Waste Regulations and 25 PA Code §§ 273.218(b), and 273.272(a) of the Municipal Waste Regulations.

M. The Department's inspections of October 20 and 23, 1995 also revealed that Boyertown and/or Frame spilled oil onto the soil beneath an oil-hauling tanker truck located at the landfill. The oil entered Minister Creek, a water of the Commonwealth. This constitutes an unpermitted discharge of industrial waste and/or other pollutants into a water of the Commonwealth, and is a violation of 25 PA. Code §101.3(a).

N. Department inspections conducted on February 14, May 2, and September 13, of 1996 have revealed that the oil-contaminated soil remains at the landfill. Boyertown and/or Frame's failure to remove the contaminated soil to an approved waste disposal facility constitutes unpermitted disposal of residual waste at the landfill, a violation of 25 Pa. Code §287.101(a).

O. Boyertown and/or Frame have failed to maintain and monitor the leachate collection, removal, and treatment system to prevent excess accumulation of leachate in the system, a violation of 25 Pa. Code §265.310(c)(3). Department inspections conducted on April 3, 13, 25, May 2 and 4, 1995 and on October 20 and 23, 1995, revealed that some leachate from both the leachate collection system and the raw leachate impoundment is escaping the collection system and impoundment, and is discharging into the surrounding soils. This activity also constitutes an unpermitted disposal of hazardous waste pursuant to and in violation of 25 Pa. Code §270.1(a).

P. The acts, omissions and conditions identified in Paragraphs G through P above constitute violations of Sections 401, 403, 603, and 610 of SWMA, 35 P.S. §§ 6018.401, 6018.403, 6018.603 and 6018.610, and Sections 307 (a) & (c) and 316 of the CSL.

Q. The violations described in Paragraphs G through P above constitute unlawful conduct under Section 610 of the SWMA, 35 P.S. § 6018.610, and Section 611 of the Clean Streams Law, a statutory public nuisance under Section 601 of the Solid Waste Management Act, 35 P.S. § 6018.601, and Section 307(c) of the CSL, and subject Boyertown and/or Frame to civil penalty liability under Section 605 of the Solid Waste Management Act, 35 P.S. § 6018.605.

R. Pursuant to Section 602 of the Solid Waste Management Act, and Section 316 and 610 of the Clean Streams Law, if the Department finds that the unpermitted discharge and disposal of solid waste is causing pollution of air, water, land, or other natural resources of the Commonwealth, or is creating a public nuisance, the Department may order the responsible party to conduct activities as required to prevent pollution and public nuisances.

**NOW, THEREFORE**, on this 25th day of March, 1997, pursuant to Section 602 of the Solid Waste Management Act, 35 P.S. § 6018.602, Sections 316 and 610 of the Clean Streams Law, 35 P.S. §§ 691.316 and 691.610, and Section 1917-A of the Administrative Code, it is hereby **ORDERED** that:

1. Boyertown and Frame shall immediately cease the recirculation of landfill leachate back into the landfill.
2. By April 21, 1997 Boyertown and Frame shall achieve and maintain two feet of freeboard in the raw leachate surface impoundment, as well as the two leachate basins. The leachate removed from the impoundment and basins must be properly treated and disposed in accordance with all applicable requirements.
3. By April 25, 1997, Boyertown and Frame shall resume groundwater monitoring for all Form 19 Municipal Waste Landfill Quarterly and Annual Water Quality Analyses (revised 7/95) parameters,

and continue the groundwater monitoring on a quarterly basis. The first quarterly sampling event shall be extended to include all parameters specified on the Hazardous Waste Groundwater Monitoring Semi-annual Report (revised 9/95). A copy of the Form 19 is enclosed with this Order. Boyertown and/or Frame shall maintain monitoring wells in accordance with, but not limited to, 25 PA. Code §265.91(d)(1) and (2) relating to highly visible colors and numbers on the steel casings, and locks and caps on the wells to prevent vandalism.

4. By April 25, 1997, Boyertown and/or Frame shall submit a written plan for the repair of the landfill cap in the two areas which were damaged as a result of the construction of recirculation pits. The plan shall be implemented within 2 weeks of the Department's approval, or approval with modifications, and said repair shall be completed no later than June 13, 1997.
5. By April 25, 1997 Boyertown and Frame shall determine the cyanide levels of the treated leachate. If the analytical data from the sampling indicates that a reduction in the cyanide levels in the treated leachate is required to meet the Berks-Montgomery Municipal Authority ("BMMA") allowable discharge limit of .5 mg./L of cyanide, Boyertown and/or Frame shall submit a plan, including recommendations and a schedule for actions which Boyertown and/or Frame will take to reduce the cyanide levels to the BMMA allowable limit and contract with BMMA to resume receiving the treated leachate from Boyertown Landfill. The plan, if necessary, shall be implemented within 2 weeks of the Department's review and approval, or approval with modifications.
6. By April 25, 1997 Boyertown and Frame shall inspect the three leachate impoundments specified in paragraph 3 above, and the leachate collection system at MH/Pump Station #7 which is nearest to the leachate basins. The inspection shall evaluate the integrity of the impoundments and collection system.
7. By May 9, 1997 Boyertown and/or Frame shall submit to the Department a written report including, but not limited to, a description of the methods used for evaluating the impoundments and collection system, the results of the evaluation conducted pursuant to paragraph number 7 of this Order, as well as a schedule for the repair of the system. Upon Departmental review and written approval or approval with modifications of the report, Boyertown and Frame shall immediately implement the repairs and schedule as Departmentally approved or approved with modifications. In no event shall repairs be scheduled to be completed later than June 30, 1997.
8. *Civil Penalties.* Within thirty (30) days of the date of this Order, Boyertown and/or Frame shall pay a civil penalty of TWENTY THREE THOUSAND DOLLARS (\$23,000.00) for the violations set forth in Paragraphs G through O above, covering the dates specifically identified and no others. The payment shall be made by corporate check or the like made payable to the Solid Waste Abatement Fund and submitted to:

Regional Program Manager  
• Department of Environmental Protection  
Waste Management Program  
Lee Park, Suite 6010  
555 North Lane  
Conshohocken, PA 19428

This action of the Department may be appealable, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 PA C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17101-8457, (717) 787-3483. TDD users may contact the Board through the Pennsylvania Relay Service at 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in Braille or on audio tape from the Secretary to the Board at (717) 787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statute and decisional law.

FOR THE COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Ronald C. Furlan, P.E.  
Regional Solid Waste Manager  
Waste Management Program

03-25-97

Date



**Pennsylvania Department of Environmental Protection**  
Lee Park, Suite 6010  
555 North Lane  
Conshohocken, PA 19428  
**June 23, 1997**

Mr. Warren K. Frame  
President, ~~Boyertown Sanitary Disposal Services, Inc.~~  
1205 Pottstown Pike  
Glenmoore, PA 19343

Dear Mr. Frame;

In response to your letter of May 30, 1997, I would like to thank you for forwarding the results of groundwater sampling at Boyertown Landfill on April 11, 1997. I would also like to correct some of the inaccuracies of your May 30, 1997 letter.

Stating that you have 'received no response to your letter of Jan. 1997' is in conflict with the facts. Regional Waste Management Compliance Specialist William Miller has repeatedly called and left messages on your answering machine and until your phone conversation on 6/9/97, had not spoken to you personally although he has had one phone message from Byron Wenger, who characterized himself as your 'assisstant'. Mr. Wenger left a voice mail message to the effect that the only time anyone was available to talk with Mr. Miller was 1:00pm to 3:00pm on Thursdays. Secondly, Mr. Miller is unaware of any time (except for the date of service of the Department's March 25, 1997 Order) at which you have communicated or attempted to communicate with him prior to your phone call of 6/9/97. I would add that your phone call of June 9th was prompted by Mr. Miller's message placed on your answering machine on Thursday, 6/5/97 at 1:30pm.

While you have taken some initial steps to comply with the Department's March 25, 1997 Order, you have not met many of the time frames in the Order and your continued non-compliance with most of the requirements of the Order and the noncompliance of Boyertown Sanitary Disposal, Inc., are of great concern to the Department. During your phone conversation with Mr. Miller you indicated a willingness to meet in an attempt to resolve these outstanding issues. By this letter I am requesting that you promptly

# Earth Data INCORPORATED



GROUND WATER AND ENVIRONMENTAL CONSULTANTS  
ST. MICHAELS, MARYLAND AND EXTON, PENNSYLVANIA

September 15, 1997

Berks-Montgomery Municipal Authority Board  
c/o Mr. James R. Brady  
Plant Supervisor/IU Coordinator  
P.O. Box 370  
Gilbertsville, PA 19525

SEP 17 1997

Re: Boyertown Sanitary Disposal Company - Municipal Discharge

Dear Mr. Brady:

Earth Data Incorporated (Earth Data) has been retained by Boyertown Sanitary Disposal Company (BSDC) to review and compile all relevant data pertaining to the raw leachate from their landfill located in Gilbertsville, Montgomery County, Pennsylvania. Enclosed please find Table 1 which summarizes all the available analytical results for samples collected from the raw leachate since 1990.

Review of available laboratory analytical data for the raw leachate indicates, with few sporadic exceptions, that parameters of concern to BMMA are consistently either not detected or are detected at concentrations below the BMMA Specific Pollutant Limits. Those few constituents at slightly elevated concentrations appeared to be isolated instances, and remained below BMMA levels in subsequent sampling events. The existing analytical data do not support the level of pretreatment currently applied to the raw leachate.

Based on the strength of this available data, BSDC would like to cease leachate pretreatment. It is understood that leachate monitoring would still be required to assure no adverse changes in water quality occur over time. The existing treatment system would remain in-place, in the event pretreatment may be required in the future.

BSDC would appreciate your review of this letter and table during the next Board Meeting for determination of future pretreatment requirements. If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,

Eric B. Schmidley, P.G.  
Senior Hydrogeologist

cc: Senator J. Gerlach  
W. Frame - BSDC  
EDI - MD Office - 2115.L2

WHITELAND TECHNOLOGY CENTER  
924 SPRINGDALE DRIVE EXTON, PENNSYLVANIA 19341  
TELEPHONE: (610) 524-9466 FAX: (610) 524-9482

**TABLE 1**  
**Raw Leachate Detected Parameters**  
**Boyertown Sanitary Disposal**

Parameter	Units	Analytical Results					BMAA Specific Pollutant Limit (mg/l)
		Influent 6/12/90	Raw Leachate 3/13/95	Raw Leachate 4/20/95	Raw Leachate 8/15/95	Raw Lagoon 3/13/97	
pH	-	8.15	7.4	6.9	8.1	NT	-----
Biological Oxygen Demand (BOD)	mg/L	20	39	NT	17	150	300
Total Dissolved Solids (TDS)	mg/L	1200	787	NT	2015	NT	3500
Cyanide	mg/L	0.013	<0.01	0.01	<0.01	0.014	0.5
Ammonia	mg/L	NT	NT	188.9	-	NT	23
Nitrogen	mg/L	NT	59.7	0.05	78.7	NT	23
Phosphate (Total)	mg/L	0.12	2.22	NT	0.45	NT	25
Phenolics (Total)	mg/L	0.011	<0.04	NT	<0.04	NT	1.7
Color (Pt/Co/Vn)	opt units	150	120	NT	200	NT	150
Oil and Grease	mg/L	<0.83	<0.90	NT	1.4	NT	25
Metals: (Total)	mg/L	NT	NT	NT	-	NT	-----
Arsenic	mg/L	0.004	6	0.0086	0.0094	ND	0.367
Antimony	mg/L	<0.002	<8.0	NT	<8.0	ND	-----
Barium	mg/L	0.7	0.693	1.77	0.584	NT	-----
Cadmium	mg/L	<0.001	<0.003	0.0002	<0.003	ND	1
Chromium (Total)	mg/L	0.005	<0.01	0.0198	<0.03	0.05	5
Copper	mg/L	<0.002	<0.01	0.019	<0.01	ND	2.8
Fluoride	mg/L	0.22	<0.5	0.51	<0.5	NT	-----
Iron	mg/L	0.42	8.24	23.4	3.4	NT	50
Lead	mg/L	<0.002	<1.0	0.0116	0.00556	ND	2
Mercury	mg/L	<0.0002	<0.0002	0.001	0.0009	ND	1
Nickel	mg/L	0.027	0.02	NT	0.05	0.09	2.27
Selenium	mg/L	<0.002	<0.005	0.024	<5.0	ND	1
Silver	mg/L	<0.002	<0.01	0.01	<0.01	ND	0.01
Zinc	mg/L	<0.02	0.011	0.021	<0.005	0.1	2
VOC's	ug/L	ND	ND	NT	ND	ND	-----
Semi-VOC's	ug/L	ND	ND	NT	ND	ND	-----
PCB's	ug/L	ND	NT	NT	NT	NT	-----
Pesticides	ug/L	ND	NT	NT	NT	NT	-----

ND: Not Detected

NT: Not Tested

Highlighted blocks indicate result above the BMAA Specific Pollutant Limit



September 15, 1997

Mr. Ron Furlan  
Regional Solid Waste Manager  
Pennsylvania Department of Environmental Protection  
Waste Management  
Lee Park, Suite 6010  
555 North Lane  
Conshohocken, PA 19428

Re: Boyertown Sanitary Disposal Company (BSDC)  
Gilbertsville, Montgomery County, Pennsylvania

Dear Mr. Furlan:

Earth Data Incorporated (Earth Data) has been retained by Boyertown Sanitary Disposal Company (BSDC) to review and compile all relevant data pertaining to the raw leachate from their landfill located in Gilbertsville, Montgomery County, Pennsylvania. Enclosed please find Table 1 which summarizes all the available analytical results for samples collected from the raw leachate since 1990.

Raw leachate currently undergoes a pretreatment process before it is discharged to Berks-Montgomery Municipal Authority (BMMA). Raw leachate flows from the landfill into a lagoon, where it is pumped into an aerator, then through a series of carbon columns, and finally to an air stripper. The treated leachate is stored in one of two basins prior to discharge to BMMA.

Review of available laboratory analytical data for the raw leachate indicates, with few sporadic exceptions, that parameters of concern to BMMA are consistently either not detected or are detected at concentrations below the BMMA Specific Pollutant Limits. Those few constituents at slightly elevated concentrations appeared to be isolated instances, and remained below BMMA levels in subsequent sampling events.

Based on the strength of this available data, there appears to be no need to pretreat the landfill leachate via carbon filtration or air stripping. The need for aeration also appears unnecessary, given removal of the carbon filtration and air stripping processes. It is understood that leachate monitoring would still be required to assure no adverse changes in water quality occur over time. Further, the existing treatment system would remain in-place, in the event pretreatment may be required in the future.

Pennsylvania Department of Environmental Protection

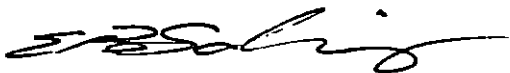
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BSDC has made a request to BMMA to eliminate raw leachate pretreatment. Please review the enclosed data at your convenience. Your comments as to the necessity of any pretreatment would be greatly appreciated during the BMMA discussions.

If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,



Eric B. Schmidley, P.G.  
Senior Hydrogeologist

cc: Senator J. Gerlach  
W. Frame - BSDC  
C. Fees - PADEP  
T. Cunningham - PADEP ✓  
EDI - MD Office - 2115.L3